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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,744	08/30/2001	Charles A. Howland	W0490/7028 RJP	8554
24222	7590	12/10/2004	EXAMINER	
MAINE & ASMUS 100 MAIN STREET P O BOX 3445 NASHUA, NH 03061-3445			PIERCE, JEREMY R	
			ART UNIT	PAPER NUMBER
			1771	
DATE MAILED: 12/10/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,744

Applicant(s)

HOWLAND, CHARLES A.

Examiner

Jeremy R. Pierce

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 138-141, 143, 145-198 and 202 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 138-141, 143, 145-198 and 202 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on October 6, 2004 has been entered. Claims 138, 169, 170, and 202 have been amended. Applicant's amendment to claim 202 and cancellation of claims 203 and 204 are sufficient to overcome the Claim Objections set forth in sections 3 and 4 of the last Office Action. Applicant's amendments to claims 138, 169, and 170 are sufficient to overcome the 35 USC 112, 1st paragraph rejections set forth in section 6 of the last Office Action because the "other than a corespun yarn" and "other than a corespun fiber bundle" language has been deleted from the claims.

Terminal Disclaimer

2. The terminal disclaimer filed on July 14, 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of the references used in the Double Patenting rejections has been reviewed and is accepted. The terminal disclaimer has been recorded. The Terminal Disclaimer overcomes the Double Patenting rejections set forth in sections 13-17.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 170-184, 187, 188, and 195-198 are rejected under 35 U.S.C. 102(b) as being anticipated by Bak et al. (U.S. Patent No. 5,792,555).

Bak et al. disclose a hybrid yarn that consists of two or more filaments (column 3, lines 23-26). The filaments are substantially normal to the cross-section of the bundle because they are interlaced with one another into an intimate mixture (column 3, lines 42-46). One of the filaments is high modulus filament that has a very high breaking strength (column 4, lines 42-47), and list several materials with breaking strengths greater than 10 g/denier (column 4, lines 50-64). Bak et al. also disclose the linear density of the yarn may be 100 dtex (column 3, line 64). With regard to claim 171, Bak et al. list aramid fibers, liquid crystal polyester fibers, and PBO fibers (column 4, lines 50-64). With regard to claim 172, Bak et al. disclose the high modulus filaments may be of one or more varieties (column 3, line 25). With regard to claims 173 and 175, the second group of filaments comprises low breaking strength materials (column 5, lines 13-39). With regard to claim 174, Bak et al. list various polyolefins, polyamides, and polyester (column 5, lines 13-39). With regard to claim 176, the weight per unit length of the high modulus fiber is more than the second fiber (Example 2). With regard to claims 177-181, Bak et al. disclose the high modulus fiber has filament densities as low as 0.1 dtex (column 4, line 22). With regard to claims 182-184, the second fibers have filament densities as low as 0.5 dtex (column 5, lines 10-11). With regard to claim 187, the high modulus filaments may comprise up to 90% of the yarn (column 3, line 66). With regard to claim 188, yarns with a linear density of 100 dtex are about 89

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denier. With regard to claims 195-198, the yarn is woven into a fabric (column 3, line 16).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 138-141, 143, 147-198, and 202 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandor et al. (U.S. Patent No. 5,597,649) in view of Howland (U.S. Patent No. 5,837,623).

First with regard to claim 170, Sandor et al. disclose a cut resistant yarn made by combining two different types of fiber (Abstract). One of the fibers has a tensile strength of greater than 10 g/denier (column 2, line 15). The filaments may be intermingled by standard methods, such as an air jet (column 4, lines 51-56), so the fibers would be oriented substantially normal to the cross-section. Sandor et al. do not disclose a denier size for the fibers. Howland discloses protective clothing that has high penetration resistance to ice picks and the like (Abstract). Howland discloses using a high weave density to obtain this high penetration resistance, and the yarns used have a denier between 55 and 1500 (column 7, line 41). It would have been obvious to a person having ordinary skill in the art at the time of the invention to use yarns having a denier of 100 in the protective clothing of Sandor et al. in order to be able to weave the

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fabric with a density that allows the fabric to be more penetration resistant, as taught by Howland. With regard to claim 171, Sandor et al. disclose aramid and liquid crystal polyester fibers (column 2, lines 18-49). With regard to claim 172, although Sandor et al. do not teaching using a combination of the high strength fibers, addition of a different type of high strength fiber to compliment the other high strength fiber would be obvious to a person skilled in the art in order to diversify the yarn's properties. With regard to claims 173 and 175, the second fiber has a low tensile strength (column 3, lines 1-16). With regard to claim 174, Sandor et al. disclose using polyamide, polyester, and polyolefin (column 3, lines 1-16). With regard to claim 176, Sandor et al. teach the second fiber may be as small as 1 dpf (column 4, line 45), and the high strength fibers may be as large as 15 dpf (column 4, line 49). With regard to claims 177-180 and 182, Sandor et al. disclose the fibers may all be as small as 1 dpf. With regard to claims 181 and 183-186, although Sandor et al. do not disclose lowering the dpf below 1, using smaller filaments in the yarn would be an obvious modification to a person skilled in the art in order to create a more flexible multi-filament yarn. With regard to claim 187, Sandor et al. disclose there should be at least 5% by weight of each type of fiber (column 5, lines 11-12). With regard to claims 188-190, Howland teach using a yarn denier as low as 55 (column 7, line 41). With regard to claim 191-193, Sandor et al. teach using spun staple fibers (column 2, lines 4-8), but Sandor et al. do not teach the cotton or worsted system of spinning. Howland also discloses that spun staple yarns are useful for manufacturing protective clothing. Howland teaches using either the cotton or wool system of spinning with staple fibers that are 1.5 inches in length is

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useful in creating a tightly woven substrate (column 7, lines 43-61). It would have been obvious to a person having ordinary skill in the art at the time of the invention to use staple fiber yarn in the fabric of Sandor et al. in order to save on the cost of creating the yarn, as taught by Howland. With regard to claim 194, Howland teaches twisting the staple fibers together to form a yarn. It would have been obvious to a person having ordinary skill in the art at the time of the invention to twist with a multiplier of at least 2.7 in order to create a yarn that is sufficiently held together to be useful in the protective clothing. With regard to claims 195-198, the yarn is used to create a woven fabric (column 5, line 24).

Next with regard to claims 138 and 169, Sandor et al. disclose weaving the fibers into a fabric (column 5, line 24). However, Sandor et al. do not disclose the claimed round packed cover factor for the warp and fill yarns. Howland discloses that improved penetration resistance is attained by weaving high modulus multi-filament yarns with a cover in excess of 100% at the center of the fill yarn and in excess of 75% between two warp ends (column 2, lines 5-20). Howland does not disclose a "round packed cover factor" of 75% on the fill yarn and 26% on the warp yarn. However, "round packed cover factor" is only an alternative method for expressing the cover of a fabric. Since Howland already disclose densely woven fabrics, with a cover factor of up to 140% (column 4, line 59), the Examiner will assume that this cover value is in line with the "round packed cover factor" that the Applicant now claims. If not, it would have been obvious to a person having ordinary skill in the art to provide a fabric with the "round packed cover factor" that is claimed in claims 138-140, since doing so would be a

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matter of increasing the density of the weave, a result effective variable, to provide a fabric with improved penetration resistance. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It would have been obvious to one having ordinary skill in the art to weave the fabric of Sandor et al. with a fill yarn round packed cover factor of at least about 75%, or about 88%, and a warp yarn round packed cover factor of at least about 26%, or about 76%, in order to increase penetration resistance, as taught by Howland. With regard to claim 141, Sandor et al. disclose the cut resistant yarn is made by combining two different types of fiber (Abstract). With regard to claim 143, the yarn of Sandor et al. comprises many fibers that could be divided into bundles. With regard to claim 152, the yarn of Sandor et al. may be classified as a fiber bundle itself. With regard to claims 147, 148, and 153, Sandor et al. disclose using aramid fibers and liquid crystal polyester (column 2, lines 18-49). With regard to claims 149 and 163, although Sandor et al. do not teaching using a combination of the high strength fibers, addition of a different type of high strength fiber to compliment the other high strength fiber would be obvious to a person skilled in the art in order to diversify the yarn's properties. With regard to claims 150, 151, and 154, Sandor et al. disclose using polyamide, polyester, and polyolefin (column 3, lines 1-16). With regard to claims 155-161, Sandor et al. disclose there should be at least 5% by weight of each type of fiber (column 5, lines 11-12). With regard to claim 162, Sandor et al. teach the second fiber may be as small as 1 dpf (column 4, line 45), and the high strength fibers may be as large as 15 dpf (column 4, line 49). With regard

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to claim 164, one could define a fiber bundle to be within the yarn of Sandor et al. that would comprise 60 to about 100 fibers. With regard to claim 165, Sandor et al. teach using spun staple fibers (column 2, lines 4-8), but Sandor et al. do not teach the denier of the yarn. Howland also discloses that spun staple yarns are useful for manufacturing protective clothing. Howland teaches yarn denier of between 50 and 100 (column 8, line 10) to create a densely woven substrate (column 7, lines 43-61). It would have been obvious to a person having ordinary skill in the art at the time of the invention to use staple fiber yarn in the fabric of Sandor et al. in order to save on the cost of creating the yarn, as taught by Howland (column 7, lines 52-54). With regard to claim 166, Howland teaches twisting the staple fibers together to form a yarn (column 7, lines 43-61). It would have been obvious to a person having ordinary skill in the art at the time of the invention to twist with a multiplier of at least 2.7 in order to create a yarn that is sufficiently held together to be useful in the protective clothing. With regard to claim 202, Sandor et al. disclose the fabric to weigh as low as 12 osy (Table 1), but fail to disclose a fabric weight of not more than 10 osy. However, a person skilled in the art would know to lower the basis weight to make a lighter fabric and lighter protective clothing article. This would offer greater comfort to the wearer at the sacrifice of losing some of the fabric's ability to resist cuts and punctures. It would have been obvious to a person having ordinary skill in the art at the time of the invention to use a fabric weight of not more than 10 osy in the fabric of Sandor et al. in order to create a lighter weight garment for the wearer.

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7. Claims 143, 145, and 146 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandor et al. in view of Howland as applied to claim 138 above, and further in view of Zhu et al. (U.S. Patent No. 6,534,175).

Neither Sandor et al. nor Howland disclosing plying the yarns together. Zhu et al. is also directed to protective fabrics (Abstract). Zhu et al. also use a combination of high strength fibers and low strength fibers in making yarn that is woven into fabric (column 2, lines 16-56). Zhu et al. teach plying yarns between 2 and 6 yarns together to form a bundled yarn for weaving (column 2, lines 1-4). It would have been obvious to a person having ordinary skill in the art at the time of the invention to ply two yarns of Sander et al. together in order to increase the strength of the yarn, as taught by Zhu et al. With regard to twisting, the amount of twist is a result effective variable that increases the yarn's durability. It would have been obvious to a person having ordinary skill in the art at the time of the invention to supply at least about $\frac{1}{4}$ or $\frac{1}{2}$ primary twist in order to form a plied yarn with sufficient durability.

Response to Arguments

8. Applicant's arguments filed July 14, 2004 have been fully considered but they are not persuasive.

9. Applicant argues that an intimate blend clearly indicates a staple yarn made up of staple fibers, and is on its face exclusive of continuous filament corespun yarn. The Examiner disagrees. Applicant points to no conclusive evidence which links the term "intimate blend" to necessitating staple fibers. Applicant also does not define "intimate

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blend" in the present specification. However, one definition for "intimate blend" can be found in U.S. Patent No. 6,668,868 to Howland et al. At column 6, lines 37-42, "intimate blend yarn or fiber bundle" is defined as "a yarn or fiber bundle including therein at least two different types of fibers, and in some instances a plurality of different types of fibers, such that each fiber type is in direct and intimate contact with fibers of at least one other type within the yarn or fiber bundle." While this definition requires at least two different fibers, there is no clear exclusion of continuous fibers nor is there any preference for staple fibers.

10. Applicant argues that Bak and Sandor et al. uses continuous filaments and not the staple yarns and intimate blend to which the present invention is limited. However, as set forth above, the Examiner does not agree that the current "intimate blend" language is limiting to staple fibers. Additionally, Sandor et al. teach that the composite yarn may comprise staple fiber (column 2, lines 4-8).

11. In response to applicant's argument that there is no suggestion to combine the Sandor et al. and Howland references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Howland provides the motivation for creating higher penetration resistance by using a tighter weave.

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12. In response to applicant's argument that there is no suggestion to combine the Sandor et al. or Howland references with Zhu et al., the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Zhu et al. is used to show the advantages of plying and twisting yarn to obtain higher strength yarn.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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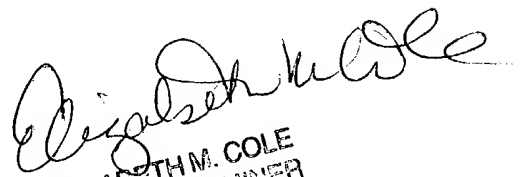
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy R. Pierce whose telephone number is (571) 272-1479. The examiner can normally be reached on Monday-Thursday 7-4:30 and alternate Fridays 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRP

JRP
December 2, 2004


ELIZABETH M. COLE
PATENT EXAMINER